de Schweinitz (G. E.)

SUBCONJUNCTIVAL INJECTIONS

OF

CORROSIVE SUBLIMATE.

A Clinical Lecture delivered in the Jefferson Medical College Hospital, May 12, 1893.

BY

G. E. DE SCHWEINITZ, M.D.,

Clinical Professor of Ophthalmology in the Jefferson Medical College;
Professor of Ophthalmology in the Philadelphia Polyclinic;
Ophthalmic Surgeon to the Philadelphia Hospital.

REPRINTED FROM THE THERAPEUTIC GAZETTE, JUNE 15, 1893.

DETROIT, MICH.:

GEORGE S. DAVIS, PUBLISHER.

1893.

Subconjunctival Injections of Corrosive Sublimate.

GENTLEMEN:—Those of you who have attended the clinical lectures on ophthalmology during the winter session which has just terminated have not infrequently heard references to the treatment of various diseases of the eye, and particularly those of syphilitic origin, located in the uveal tract, by means of subconjunctival injections of the bichloride of mercury. Recently, we have been studying the effect of these injections upon patients who attend the out-service department, and it is expedient that you should become more thoroughly acquainted with the character of the lesions that are most favorably affected, and with the doses, technique, and complications.

Subconjunctival injections are by no means a new method of treatment. So long ago as 1866, Rothmund* advocated the injection of a solution of salt beneath the conjunctiva for the purpose of absorbing corneal opacities. Secondi† treated with success abscess of the cornea and hypopyon-keratitis with subconjunc-

* *Klinische Monatsblätter für Augenheilkunde*, 1866, p. 171.

† *Giorn d. R. Accad. di Med. di Torino*, 6, 7; abstract in *Nagel's Jahresbericht*, vol. xx. p. 258.

tival injections of sublimate; he also employed the method in iritis and in choroiditis and other diseases of the deeper structures of the eye. Darier* has particularly urged the method, and much credit is due to him for carefully classifying the diseases in which he found it successful. Quite recently he has again reviewed the whole subject, and reasserts his adherence to a method which he believes is based upon the soundest therapeutic principles and has been productive of the happiest results.†

The theory of this treatment is very evident, —namely, that a drug which is believed to be antagonistic to the morbid process shall be introduced directly into the affected organ, and thus come in contact in a concentrated form with the lesions which it is to antagonize. Under these circumstances it is plain that its efficacy is more enhanced than would be the case if it reached the organ after a general distribution through the system. As has been pointed out by several authors and one or two reviewers, this method is analogous to local influence secured by the instillation of a mydriatic. Dilatation of the pupil may be produced by impressing the constitution with atropine or belladonna, but it is more reasonable and more simple to drop a solution of this drug in the conjunctival cul-de-sac. In like manner the antiseptic action of bichloride of mercury may be obtained by instilling a solution of it in the conjunctiva, or its effect upon the eye may be acquired by giving it by the mouth, or by injecting it hypodermically, but its absorption is more

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* *Archives d' Ophthalmologie*, 1891, p. 449.

† *Annales d' Oculistique*, April, 1893.

rapid when it is inserted beneath the conjunctiva, and certain experiments, especially those performed by Pflüger, seem to show that fluids thus introduced into the eye directly reach the cornea and anterior and posterior chambers, the suprachoroidal space, and even the peripheral layers of the crystalline lens and the vitreous humor. Therefore, as Grandclement has well said, it is not surprising if microbic or organic diseases, situated in the parts to which the sublimate has access when injected beneath the conjunctiva, disappear more promptly than in ordinary ways, provided they are incompatible with its bactericidal, or at least its antiseptic, properties. It is possible, too, that these injections act somewhat in the nature of a revulsive ; at least, this is the view entertained by the author just quoted, who believes that they have some curious constricting power on vascular stases in the affected coats of the eye.

Be this as it may, the fact remains that a goodly number of cases have been reported in which excellent results have followed the method, and these may be classified as follows: Infective ulcers of the cornea; suppurative conditions,—for example, hypopyon-keratitis and corneal abscess ; and diseases of the uveal tract, especially when they are of syphilitic origin and when they are not too acute,—*i.e.*, parenchymatous iritis, cyclitis, irido-choroiditis, and choroiditis itself. Less encouraging are the results which have been obtained in neuritis, retinitis, and atrophy of the optic nerve. Finally, and this is a most important point, a certain number of cases of sympathetic ophthalmitis, usually presenting themselves in the form of a uveitis, are said to have been cured by sub-

conjunctival injections of corrosive sublimate. Indeed, as you will remember from the lectures last year, not only has the corrosive sublimate been injected beneath the conjunctiva in cases of this character, but also directly into the vitreous humor, constituting then an intraocular injection. The subconjunctival injections, however, are safer, and there is not yet sufficient evidence at hand to justify unequivocal recommendation of intraocular injections of antiseptic substances.

Let me now present to you a few cases and demonstrate the method. The first, a young man of twenty-two years of age, has been under my care for a long time, not only in this hospital, but also in the Philadelphia Hospital. When first seen, more than a year ago, he had an acute serous iritis, or keratitis punctata, due to acquired syphilis. This gradually subsided under the usual treatment, but, as you see, the centre of each cornea is occupied by a considerable white infiltration which has stubbornly resisted efforts to dissipate it. He has received a number of injections of sublimate beneath the conjunctiva, and although the test-types do not show any improvement in vision, he states that his sight is clearer. The injection is performed as follows:

The eye is thoroughly cleansed, and anæsthetized by the instillation of a four-per-cent. cocaine solution, and a hypodermic syringe thoroughly sterilized with carbolic acid (1 in 20) is used for the purpose of introducing the drug. I seize a fold of conjunctiva about eight millimetres from the corneal margin and inject 4 minims of the solution, which, you see, causes a well-marked area of chemosis. The

strength of the solution has varied with different operators. Darier recommends 1 to 1000, and thinks the first dose should not exceed 1 division of a Pravaz syringe, or, in other words, $\frac{1}{20}$ milligramme of the sublimate solution. The solution which I have just employed is 1 to 2000, and consequently, instead of injecting about 2 minims, I have used twice that quantity.

The next case that I show you is a boy with a large infiltrated ulcer of the lower margin of the cornea. This has probably started in a phlyctenule, but has been subject to a number of relapses, and I understand from Dr. Veasey that this is the fourth time that he has presented himself with a fresh exacerbation. He has not as yet received an injection, and, with the precautions previously described, I repeat what you saw me do in the other case.

Immediately following an injection of this character there is some smarting, which, however, soon passes away, and very few complications have been reported. These consist chiefly of pain when the point of the syringe is not sufficiently sharp, or when a subconjunctival nerve is punctured; of an ecchymosis, caused by the penetration of a small blood-vessel beneath the conjunctiva, which, you see, has happened in the left eye of the first case; and, finally, of the production of keratitis, or even hypopyon-keratitis, such, for example, as Darier has described. The last-named accident could scarcely occur except by some fault in the technique,—probably imperfect sterilization of the instrument. Great care must be taken that everything is clean, and the best instrument to use is a Pravaz syringe, the needle of which is

composed of platinum capped with iridium, so that it may be heated red hot before each injection. Naturally, after each injection there is considerable chemosis, which can scarcely be regarded as a complication.

The number of injections must depend upon the case. In moderately acute cases every second or third day is probably sufficient, and Darier formulates the rule that if no results are obtained after ten injections have been made, it is useless to pursue the treatment further. In chronic cases the duration of the treatment is necessarily prolonged, while in cases presenting very active lesions,—for instance, in a rapidly-infiltrating infective ulcer, or in a sympathetic ophthalmitis,—not only should the injections be more frequent, but the quantity of fluid should be as rapidly increased as is compatible with safety and with the amount of reaction which is produced.

Thus far I have quoted to you the favorable results, especially the reports given by those in France, who are warm advocates of the method. It is proper to state, however, that in the many discussions which have taken place upon this advance in ocular therapeutics, if it may be so denominated, more than one surgeon has raised a warning voice. For example, Despagnet and Vignes have doubted the efficacy of the drug in controlling, or even favorably modifying, so serious a disease as macular choroiditis. One warning is sounded even by the warmest advocates of the method,—namely, that it should never be used in cases of such character that there is circulatory stasis, rendering the absorption of the liquid either difficult or impossible. Under these circumstances the drug

would simply lie beneath the conjunctiva and act as a foreign body. Therefore in acute iritis, no matter what its type, general medication is of the first importance, and evident indications for other means should not be neglected,—for example, the use of atropine, or touching an ulcer with the galvano-cautery, or other stimulating application.

The experience of this clinic as to the efficacy of these injections is still a limited one. I have just shown you one case in which there is doubtful improvement. In another case of stubborn syphilitic plastic iritis, which has received several injections, the improvement has been surprising and prompt. One example of episcleritis treated with injections in the manner you have just witnessed, by myself and also by Drs. Phillips and Veasey, rapidly improved, after the ordinary methods had yielded indifferent results. At present, however, the disease appears stationary. It is possible that future injections may be more beneficial. A young man under my care in another hospital for gonorrhœal iritis—a disease which is singularly stubborn—has received three injections, two days apart, and has evidenced an improvement in his condition such as I have never seen occur in so short a time under any other method. Other cases which I might describe have not improved more rapidly than by the older and well-tried measures. I have had no experience that is worth quoting in combating the lesions visible only with the ophthalmoscope,—for example, macular choroiditis,—and I must confess that it is very difficult for me to be persuaded that much is to be expected under these circumstances. As I have already told

you, however, Darier and other reporters claim very positive results.

Thus far I have spoken only of corrosive sublimate. Trichloride of iodine may be used in the same way, and also the cyanuret of mercury. In episcleritis, Snellen* injected a solution of sublimate (1 to 5000), and found it of great advantage. Van Moll,† who reports excellent results in iritis and irido-cyclitis with subconjunctival injections of sublimate, has found injections of salicylate of sodium useful in scleritis. Darier, however, referring to the same drug, and also to the trichloride of iodine and other medicaments, gives his preference, without hesitation, to the bichloride of mercury.

With proper precautions, reasonable care not to increase the dose too rapidly, and judicious selection of cases, no harm accrues from the treatment, and if we may believe the reports to which I have so many times referred, very good effects have been produced,—effects which, in a limited experience, we have seen repeated in some instances in this clinic and in the Philadelphia Hospital. Except in a few cases, sufficient time has not yet elapsed to form an accurate opinion as to the ultimate value of these injections,—*i.e.*, whether the good results which sometimes appear with surprising rapidity are permanent or not. Indeed, it has been intimated by some observers that the effects of the sublimate under these circum-

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* "Transactions of the Ophthalmological Society of the United Kingdom," vol. x. p. 210.

† *Klinische Monatsblätter für Augenheilkunde*, October, 1892, p. 329.

stances is temporary, and relapses are more likely to occur than when the mercurial influence has been secured by its introduction through the ordinary pathways. In order to satisfy ourselves upon these and other points connected with the method, we are now employing it systematically in all suitable cases. You shall hear the results at some future time, but the cases you have seen to-day serve to make you familiar with the very simple technique required to carry out the method.

JANUARY 16, 1893.

WHOLE SERIES, VOL. XVII. No. I. THIRD SERIES, VOL. IX.

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Therapeutic Gazette

A MONTHLY JOURNAL

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GEORGE S. DAVIS, DETROIT, MICH., U.S.A.,

OR

714 Filbert Street, Philadelphia, Pa.

Published on the Fifteenth Day of Every Month.

SUBSCRIPTION PRICE, TWO DOLLARS A YEAR.

Agent for Great Britain: Mr. H. K. LEWIS, Medical Publisher and Bookseller, 136 Gower Street, London, W. C.

Entered at the Post-Office at Philadelphia, Pa., as second class mail matter.

PRINTED BY J. B. LIPPINCOTT COMPANY, PHILADELPHIA.